

LX.—*Fishes from Tobago.* By J. R. NORMAN.

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THE collections of fishes made at Tobago by Mr. P. L. Guppy, and received from him during the last three years, contain examples of 150 species, one of which is described below as new to science. In addition, eight species were previously unrepresented in the Collection of the British Museum (Natural History); of these, five require a new description.

Clinus guppyi, sp. n.

Depth of body $3\frac{2}{3}$ in the length, length of head $3\frac{1}{4}$. Snout shorter than diameter of eye, which is $3\frac{1}{5}$ in length of head, and more than twice the interorbital width. Head naked. Snout rounded; jaws equal anteriorly; maxillary extending to below posterior third of eye. Outer teeth of both jaws strong, conical, curved inwardly; a band of villiform teeth behind these anteriorly; vomer with a V-shaped patch of moderate teeth; band on palatines short. Nostril with a tufted filament; orbital tentacle rather small; a series of hair-like filaments on each side of the neck. Five or six short gill-rakers on lower part of anterior arch, those near the angle bifid at their extremities. Vertical fins not scaly. Dorsal XIX 11; spines gradually increasing in length to the seventh, thence subequal to the fifteenth, which is $\frac{2}{3}$ length of head; seventeenth and eighteenth shorter; soft fin rounded; rays much longer than the spines. Anal II 18; commencing below eleventh or twelfth dorsal spines. Pectorals slightly shorter than head. Pelvics shorter, inserted just behind level of posterior margin of præoperculum. Caudal rounded. Caudal peduncle short, its length $\frac{1}{4}$ length of head. $5\frac{1}{2}$ scales from anterior dorsal spines to lateral line. Reddish brown, with indistinct darker vertical bands. Cheeks mottled with darker. A large dark opercular spot, and an indistinct spot superiorly in axil of pectoral. Pectorals, caudal, soft dorsal, and posterior part of anal with dark spots along the rays.

A single specimen, 90 mm. in total length.

Near *C. nuchipinnis*, Quoy and Gaimard, differing especially in the form of the dorsal fin.

Calamus macrops, Poey.

Depth of body $2\frac{1}{4}$ in the length, length of head $3\frac{1}{4}$. Snout $1\frac{1}{3}$ diameter of eye, which is $3\frac{1}{2}$ in length of head

and $1\frac{1}{4}$ in interorbital width. Anterior profile steep and nearly straight. Snout and interorbital space naked. Præ-orbital deeper than eye; distance from eye to end of maxillary $2\frac{1}{2}$ in length of head. Anterior teeth acute, with 10–12 small canines in each jaw. Lateral teeth in three rows in upper jaw, the outer obtusely conical, the others molariform; two rows in lower jaw. Maxillary scarcely reaching vertical from anterior margin of eye. Six short gill-rakers on lower part of anterior arch. Dorsal XII 12; third spine longest, nearly $\frac{1}{2}$ length of head; first soft ray $\frac{1}{3}$ length of head. Anal III 10; third spine longest, equal to diameter of eye, shorter than soft rays. Pectoral longer than head, almost reaching origin of anal. Pelvics $\frac{2}{3}$ length of head. Caudal forked. 47 scales in lateral line, 6 from origin of dorsal to lateral line. Greyish silvery; a silvery streak below the eye; fins pale, spinous dorsal with dark edge; a dark spot superiorly in axil of pectoral.

A single specimen, 200 mm. in total length.

Upeneus parvus, Poey.

Depth of body $4\frac{3}{4}$ to 5 in the length, length of head $3\frac{2}{3}$ to $3\frac{3}{4}$. Snout slightly longer than diameter of eye, which is $3\frac{1}{5}$ to $3\frac{2}{3}$ in length of head. Interorbital region flattish, its width equal to diameter of eye. Lower jaw slightly the shorter; maxillary reaching to below anterior third of eye. Teeth very small, conical, in two series anteriorly and a single series laterally. Barbels reaching angle of præoperculum when laid back. Gill-rakers slender, about 18 on lower part of anterior arch. Dorsal VII, I 7–8; spines slender, first longest, $\frac{3}{5}$ length of head and $1\frac{1}{3}$ longest soft rays. Anal II 6; longest soft rays equal to those of second dorsal. Pectoral $\frac{2}{3}$ length of head, barely reaching beyond tips of pelvics. Caudal deeply forked. Brownish above, fading to white below; a yellowish longitudinal band along the side; fins pale, caudal with three or four dark oblique bars on each lobe.

Three specimens, 70–90 mm. in total length.

CENTROCHROMIS, gen. nov.

(Type, *Glyphidodon rudis*, Poey.)

Agrees closely with *Glyphidodon*, but is distinguished by having the præoperculum coarsely serrated.

Centrochromis rudis.

Glyphidodon rudis, Poey, Memorias, ii. p. 191 (1860); Günther, Cat. Fish. iv. p. 37 (1862).

Abudefduf rudis, Jordan and Evermann, Bull. U.S. Nat. Mus. xlvii. p. 1563 (1898).

Depth of body $1\frac{3}{4}$ to 2 in length, length of head $3\frac{1}{3}$ to $3\frac{1}{2}$. Snout slightly longer than diameter of eye, which is $3\frac{1}{3}$ – $3\frac{2}{3}$ in length of head and $1\frac{1}{4}$ to $1\frac{1}{2}$ in interorbital width. Snout and lower jaw naked. Maxillary extending to vertical from nostril. Teeth in a single series, equal, all deeply bifid. Preoperculum coarsely serrated; operculum with a flat spine. Dorsal XIII 12; fourth to sixth spines longest, $\frac{2}{3}$ to $\frac{1}{2}$ length of head, shorter than longest soft rays; soft fin obtusely angular. Anal II 10; second spine strong, nearly $\frac{1}{2}$ length of head. Pectoral nearly as long as head. Pelvics scarcely reaching vent. Caudal emarginate, with rounded lobes. Caudal peduncle twice as deep as long. 25–27 scales in a longitudinal series, $3\frac{1}{2}$ from origin of dorsal to lateral line. Five broad dark vertical bands on body, wider than the interspaces; a black spot superiorly in axil of pectoral.

Five specimens, 115–180 mm. in total length.

Microspathodon chrysurus, Cuv. & Val.

Depth of body 2 in the length, length of head $3\frac{1}{4}$ to $3\frac{1}{2}$. Snout longer than diameter of eye, which is $3\frac{3}{4}$ to 4 in length of head. Interorbital space convex, its width $1\frac{1}{2}$ times diameter of eye. Preorbital broad, deeply notched, its depth above angle of mouth 1 to $1\frac{1}{4}$ times diameter of eye. Lower jaw slightly shorter than upper; maxillary extending to vertical from nostril. Teeth in both jaws flat, sharp, movable, in a single series; in the lower jaw twice as large as in the upper. Head entirely scaly, except the lower jaw. Dorsal XII 15–16; spines gradually increasing from the first, last $\frac{1}{2}$ length of head; soft fin angular. Anal II 13–14; second spine about $\frac{1}{2}$ length of head. Pectoral as long as, or slightly longer than, head. Pelvics reaching vent or slightly beyond, but not to anal. Caudal forked; upper lobe longer than lower. Caudal peduncle nearly twice as deep as long. 29 scales in a longitudinal series, $3\frac{1}{2}$ from origin of dorsal to lateral line. Brownish; scales on body with darker edges; some white spots scattered on head and nape, and to a lesser extent on back and scales of dorsal fin. Dorsal, anal and pelvic fins dusky; caudal yellow.

Two specimens, 147 and 135 mm. in total length.

Batrachoides cryptocentrus, Cuv. & Val.

Depth of body $4\frac{3}{4}$ to $5\frac{1}{2}$ in the length, length of head 3 to $3\frac{1}{4}$, width of head between opercles $3\frac{1}{2}$ to $3\frac{3}{4}$. Diameter of eye 5 to 6 in length of head, equal to or slightly less than interorbital width. One subopercular and two opercular spines. Maxillary extending beyond eye. Lower jaw a little projecting. Teeth on vomer and palatines large, uniserial, obtusely conical; 4 on vomer, 10 to 13 on each palatine; lower jaw with a single series of similar teeth, and anteriorly a patch of sharper teeth; premaxillaries with two rows of villiform teeth. Head and body entirely naked; head covered with small filaments, that above the eye well developed. Snout with a fringe of filaments; another fringe on lower jaw, four of which are distinctly larger than the remainder. From above and below base of pectoral two rows of open pores, appearing as white spots, which become indistinct in the adult, extend backward nearly to end of soft dorsal and anal respectively. Dorsal III 26-28; spines short, almost entirely hidden under the skin. Anal 22. Pectoral 21; a pigmented patch in the axil, but no foramen. Caudal 13, rounded. Brownish, paler below, with traces of darker vertical bands, disappearing in the adult; fins edged with darker. In young and half-grown individuals the throat is marbled with pale irregular spots.

Three specimens, 70-220 mm. in total length.

LXI.—*Note on the Forward Progression in its Shell of the Animal of the Nautiloidea and Ammonoidea.* Compiled from Notes left by the late G. C. CRICK, F.G.S., by B. B. WOODWARD, F.L.S.

THE three facts which are necessary to remember when attempting to form a conception of the mode of growth in the Nautiloidea and Ammonoidea are:—

- (1) Growth in bulk of the animal taking place at regular intervals, terminated respectively by the formation of a new septum.
- (2) Rigidity of the shell, necessitating a forward movement of the too bulky animal.
- (3) Faculty of secreting gas, which must not be allowed to escape from the chambers of the shell.